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ABSTRACT

This paper reports the results of a deliberate effort to help preservice science teachers improve their ability to learn from experience and take charge of their own professional development as teachers. The study was conducted by a teacher educator who simultaneously taught a physics methods course and a 12th-grade physics class and thereby learned to "listen to his own experience" and listen to his students. Data sources for the study included small-group interviews with and personal journal entries by student teachers at Queen's University in Kingston, Ontario (Canada). Student teachers were asked to "listen to yourself" (their own sense of good teaching and learning) and to "listen to your students" (what they say about good teaching and learning). The "before and after" story of a student teacher who became a physics and mathematics teacher is offered to illustrate the point that it is necessary to examine one's own teaching during the preservice program in order to be able to subsequently judge the impact of experience. Analysis of students' statements after their practicum experiences indicate that the "authority of experience" can be taught in a significant way to those entering the profession. (JDD)

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TEACHING TO BETTER UNDERSTAND HOW A TEACHER LEARNS TO TEACH: CAN THE AUTHORITY OF PERSONAL EXPERIENCE BE TAUGHT?

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INTRODUCTION

This paper reports the results of a deliberate effort to teach pre-service science teachers to improve their ability to learn from experience. Earlier studies of similar groups of student teachers suggested that "learning from experience" is an undeveloped aspect of learning to teach, when contrasted with the more familiar "learning from experienced teachers" and "learning from professors" (Munby & Russell, 1994). This aspect of learning to teach was developed in relation to my personal experiences returning to the classroom to teach Grade 12 physics. The data presented here were supplied by student teachers at Queen's University who volunteered to participate in our continuing studies of the development of teachers' practical professional knowledge. Several small-group interviews as well as personal journal entries were contributed by the participants, who were encouraged to "listen to themselves" and to "listen to their students" as well as to experienced teachers and professors. When they returned from their second three-week placement, they were asked several direct questions about listening to self and to students. Their statements indicate that the "authority of experience" can be taught in a significant way to those entering the profession..

RETURNING TO THE CLASSROOM: PERSONALLY EXPERIENCING THE AUTHORITY OF EXPERIENCE

"Returning to the grade 12 physics classroom" for one 75-minute class each day between September 1991 and January 1992 and again between September 1992 and January 1993 was one of the most significant moves I have made in my 17 years as a teacher educator concerned with the teaching of secondary science. While engaged in this daily teaching, I continued to carry out 90 percent of my usual full-time responsibilities at the university. In 1993-94, I have "returned to the university" 100 percent, to begin to reinvent my teaching of the physics method course, something I could not gain proper perspective on while re-mastering the teaching of high school physics.

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Returning to teach grade 12 physics while taking physics method students through the first half of their pre-service course work had elements of a dual existence. I had developed a set of strategies for the method class over a period of 14 years in a faculty of education. The grade 12 teaching was an extremely satisfying experience. Although I already knew how to teach in most respects, I had many specifics to learn about the course, textbook, and the particular school. The new teachers in my method class appeared, at times, to have little or no idea how to take advantage of what I was doing as I taught each day in the school. The teacher who gave me access to a "class of my own" also taught the method students each week, and he had little difficulty impressing the teachers-in-training with his first-hand, well-refined practical knowledge of demonstrations and the daily routines of teaching.

My view of my task as a teacher educator was a different one: to encourage the new teachers to question the daily events of practice, to consider and attempt alternatives, and to take charge of their own professional development as teachers. This is what I had attempted to do personally while working in the physics classroom. In 1992-93, I "listened to my own experience" virtually every day by preparing computer files in which I recorded my impressions of the lesson I had just taught. One of the most obvious effects of this process was the discovery that listening to my own sense of my work usually resulted in better understanding of my concerns and a plan for the next lesson to be taught. In both 1991-92 and 1992-93, I worked to collect "backtalk" from the students I was teaching. These data took the form of open-ended written comments about the effects of my teaching and their reactions to the subject matter. I was very aware of, and increasingly convinced of the value of, "listening to my students," a process I have always attempted to practice in the teacher education context.

For reasons that may be related to group dynamics and "first impressions," the 1991-92 method group seemed more interested in and satisfied by my daily teaching routine in a nearby school than did the 1992-93 group. To make preliminary sense of the 1992-93 group's dissatisfactions, I constructed seven "barriers to learning to teach" (Russell, 1993) from statements they made in individual mid-program interviews as I was completing my second teaching of the grade 12 physics course. The 1991-92 and 1992-93 method students were the first two groups whom I have asked to prepare, as a final written assignment, the "story" of their experiences learning to teach. This assignment is intended to take them beyond whatever integration and interpretation of their course work and practicum experiences might occur coincidentally during the B.Ed. program, to create a document to which they can return after a year or two of teaching and against which they can judge the quality of their personal development as a science teacher.

The 1993-94 method class opened with two strategies intended to foreshadow the attention in practice teaching to the "authority of experience." Committees were set up to facilitate my communication with the class on various aspects of the course (including "backtalk"), and four-member discussion groups were formed. About two-thirds of the time (five weeks) before the first practice teaching assignment was devoted to unit-by-unit analysis of the Grade 12 physics course for Ontario, with the small groups moving among tasks such as lesson planning, lab work, demonstrations, and test-item writing as we progressed through the units. Each group reported its efforts to the entire class, establishing a pattern in which they listened to each other's earliest ideas about how to teach physics. When the student teachers returned from their first teaching assignment, they were asked to complete a four-column chart in which they recorded what they learned (a) from experienced teachers,

(b) from education professors, (c) from their own responses to teaching, and (d) from the students in their classes.

The 1993-94 students are now engaged in the preparation of their end-of-program personal stories. In that task they have been assisted by a member of the 1991-92 group, who serendipitously illustrated the purpose and personal value of this assignment. Midway through his second year as a physics and mathematics teacher, "R" returned his story to me with an "update" of similar length, and permission to share his two stories with my 1993-94 students. These "before-and-after stories" illustrate the purpose of the assignment, and are intended as an illustration rather than as an indication of desired content or focus. R's story is one possible interpretation of the significance of a preservice teacher education program.

THE IMPACT OF EXPERIENCE ON ONE BEGINNING TEACHER

R's story of learning to teach (April 1992)

The first three paragraphs of R's "story" assignment indicate something of the initial "sense-making" that he achieved during his pre-service program experiences.

> In the student vernacular, this place is called "teachers college". This is very peculiar, for it is a place that cannot possibly live up to its name. Teaching is a very personal thing. How can anyone teach something so ephemeral as teaching? There are no instruction manuals and no absolute procedures to follow. So the question is: "What are we to learn from this 'teachers college'?" I have just come to realise the aim of this place: It is to build our confidence level. I firmly believe this because, you see, each and every one of us came to this faculty already knowing how to teach. Basically everything was in place when we arrived here. I'm sure that if someone had put us in schools in September we would have adapted after a couple of weeks. We wouldn't have been very confident about teaching because we would have thought we knew nothing about it, but we wouldn't have known that nobody else can possibly know anything about it either. It's a comforting thought to have, starting to teach, that even with all the experience that a teacher can acquire, one can never stop learning how to teach. Not only because nobody can tell us but also because it is impossible for us not to learn everyday (We are teachers; this learning "thing" is a prerequisite for being one). So we are in effect all in the same boat and will be throughout our careers. A beginning teacher and an experienced teacher are really not that different. One simply has more confidence than the other and knows more tricks. After all, isn't experience a wonderful confidence builder?
>
> I must say that after my first teaching round my motivation level was at an all-time low. Things that I was shown here in some courses were not realistic. I was told by numerous teachers during the round that I'll learn my craft during my rounds and in my first year of teaching. Of course that made a lot of sense, so I asked myself: "What am I going to do for the rest of the year? Why am I here?" It's a good thing that I figured out this "confidence" thing. Otherwise things would have looked pretty grim.

I guess that if my students were asked what they remember of my science class, I would want them to say that they remember doing lots of hands-on stuff without too many boring lab write-ups. Formal write-ups are needed but I don't see the positive side of requiring it for every lab. I see that as a good way of turning students off about science. The skills in writing are necessary but science experiments should be fun and interesting--something the students look forward to, and not dread the drudgery of writing a long report. After the basics have been taught in the early grades, there is no real need to hammer people with it every time. I would hope that they would have enjoyed themselves and felt at ease within the class in general. (R, personal communication, April, 1992)

R's story as a new teacher (January 1994)

The following paragraphs are the ones in which R speaks most directly to the issues raised in his earlier story. His stance toward the value of the pre-service year (developing self-confidence) has not changed, but he now has a new view of the significance of formal lab write-ups.

My teaching style hasn't changed one bit from the day I walked into Queen's. I still believe that every person coming into teacher's college today knows how to teach. He or she has internalized it from their own education. Self-confidence is the only factor that changes. We simply get more comfortable with the subject, although I have noticed that some teachers get too comfortable ("fossilized" might be a better word).

Confidence is the important thing taught at Queen's. When people from the faculty come to my school and learn that I'm a relatively new teacher, they ask, "What did you learn at the faculty that you actually used?" My answer is "Self-confidence." It is the one and only thing that was important. The courses we had to take (I'm still not over those media labs) were, for the most part, irrelevant. I'm talking about the optional courses here, not the subject courses.

The biggest philosophical change for me was for lab write-ups. In my story, I talked about not understanding the need for a write-up for every lab. I do now. It's the carrot in front of the donkey thing. If it's not worth anything, they don't do it. The depth of the report may be altered, but a report must be done. And besides, they must practice their writing skills--there is really no alternative. The writing skills (even at the OAC [university entrance] level) are extremely bad. (R, personal communication, January, 1994)

These ideas from R show both stability and change over a period of 18 months. (They are, of course, one person's sense of his development as a teacher, not a prescription for all teachers.) One self-evident point I take from his original story and his first sequel is that <u>if he had not written the first story during his pre-service program, he could not have made the detailed comparisons and begun to judge the impact of experience</u>. During the year that R was in my class (1991-92), I was immersed in my own discoveries about the impact of personal experience; the second year of part-time teaching (1992-93) extended and refined my sense of my own discovery of the "authority of experience" and how it can contribute to the understanding and improvement of one's own teaching. Now, in 1993-94, teaching

students to recognize and listen to the "authority of experience" has been a major theme of my method course in physics. When the student teachers returned from their second three-week placement, the most obvious way to assess the impact of my efforts was to ask them. The following replies indicate that it is indeed possible to teach beginning teachers to recognize the "authority of experience." Nine student teachers participating in our research submitted written statements; one preferred a recorded interview.

THE IMPACT OF PRACTICUM EXPERIENCES ON STUDENT TEACHERS: RECOGNIZING THE AUTHORITY OF EXPERIENCE

The data discussed here were provided as direct and indirect responses to the following questions intended to elicit indications of success or failure in helping new teachers recognize the authority of experience:

* Has asking you to "listen to yourself"--your own sense of good teaching and learning--made any differences for you?
* Has asking you to "listen to your students" and what they say about good teaching and learning made any difference to you as you try to learn to teach?
* Has the contrast between learning from others and learning from yourself led you to do anything differently in Round 1 or 2, or to view your in-school experiences any differently?
* (In part these questions are asking, "What might you have missed if we had not been urging you to consider these angles on learning from experience?")

Some responded to the questions directly; others responded in narratives that responded to the set of questions. Each of the 25 students in this year's class has used as an identifying code a pair of identical letters ranging from AA to YY. These codes are used to identify each of the responses below. The complete set of written responses is presented here to show the range in length and detail. Only minimal comment and interpretation are provided, to permit the reader to form a personal assessment of the extent to which these statements indicate that something unusual has been accomplished in terms of encouraging student teachers to listen to their own voices and to the voices of their students.

94-VV: *Listening to myself has by far been one of the more useful methods of learning this year.* Keeping a journal, talking to friends, voicing ideas, have all made me look at myself, who I am, as a teacher, and form some opinions about what it is that I want to do as a teacher and how I am going to go about it. I tend to be very "wishy-washy" when it comes to making decisions, voicing opinions--keeping a journal, and having discussions, has forced me to think about my own ideas and commit them to paper. I just read "R's" story and he states that we are all teachers when we arrive here in September. I have to agree with him, but "listening to myself" has helped me find where my strengths are and how to draw on them, and also to find my weaknesses and try to find ways to improve on those.

Listening to students is what teaching is all about. It is not even necessary to get written data from them to find out what they find good and bad. Especially with the grade eights that I taught. I was always aware of how well a lesson went by their

immediate reaction. I had the opportunity this round to teach the same lesson four times. This is where learning from the students became so beneficial. I could expand on areas the students in the first class had problems with--because for the most part they all stumbled on the same issues. Their feedback, whether it was questions, moans and groans, blank faces, directed how I taught the remainder of that lesson and what changes I would make for the next one.

To give an example, labs! These students were spoon-fed everything! I realize they are young and need a lot of guidance, but at times it seemed detrimental. The first lab I did with the class, my associate had given me an overhead with the instructions. She suggested I have them copy down the instructions and then I should explain/demonstrate the lab to them. Then she said to put a chart on the board ("because they couldn't make one themselves") and explain what to record in the chart. Well, I felt the lab went horribly; none of them seemed to know what they were doing; they were putting mass measurements in the volume column and vice versa, and measuring everything in mL...etc. I felt like they didn't get anything out of it! So, lab 2--new strategy--I don't think my associate liked it--but, oh well (I'm trying to get better at taking risks)--I put them into groups, gave each group the lab instructions. They had to go through the instructions as a group, write the procedure in their books IN THEIR OWN WORDS, and make a chart to record their observations. Well, at first they were a bit startled: "Make a chart? What do you mean?" I explained that they had to figure out what they were observing and they should make a chart to record any of their observations, and with that they went on their way. They were asked to show their chart to me before they began to perform the lab, and they were all different--but perfectly fine. And not one of them asked me what they were supposed to put where, or why they were doing it. The lab was completed quickly, quietly and smoothly and it was much less chaotic. In the first lab I don't think they even knew what to look for.

It's in ways like this that I listen to the students. It seemed quite obvious to me, from the questions that they were asking, that this chart I had drawn for them had no meaning for them. However, when they had to make their own, they were forced to think about what it was for and why they were doing it. I have a feeling if I had listened to my associate instead of my students I would have felt just as bad after the second lab as I did after the first.

Listening to students is probably the most important aspect in learning to teach. Every class is different; every student is different; no associate or faculty member is going to be able to give you a no-fail solution to all the problems of teaching,for that very reason. It's the students that will tell you what changes you need to make, and your own feeling about how the class is. That is why these two aspects of learning to teach are so important because ultimately, eventually, it will be just you and your students in that classroom.

93-BB: * Yes - this is something that I was doing before I came here and it is extremely useful in the development of professional skills.

* Definitely - *this is something that I did learn in this classroom.* I asked for "back talk" in both rounds and I was always pleased with the comments. The students appreciated the opportunity to express their opinions - which were generally insightful.

* I believe that I am open-minded and I am also analytical. I look at ideas - determining if I think they are good (for ME) and then try them (the good ones) out. The next step is to look at how it worked - it's not necessarily a bad idea just because it doesn't work perfectly the first time. Modifications are sometimes necessary.

* Backtalk and increased personal emphasis on analyzing the process of learning to teach.

93-PP: 1. Yes, listening to myself through journal reflections in particular has helped to focus and refine my ideas about teaching.

2. Yes, the students have some useful input. I have to be careful to listen to suggestions for improvement as well as good points.

4. Student comments and my own feelings about what I should do and am doing *are of more value in how I will teach* than what I see on an evaluation by an associate teacher.

[Note: I never expected such a comparison when I set out to encourage new teachers to listen to themselves. This comment may reflect the fact that associate teachers write their evaluations with considerable attention to the fact that comments must be "glowing" if they are to be helpful in a "tight" job market. One result could be that the written evaluation does not have much direct connection to improving future practice.]

93-WW: 1. Listening to myself has been a good exercise for gaining confidence. It is that "gut" feeling that will always be with us; if we learn to listen to it and trust it then we will have an easier time the first year we teach. Listening to yourself helps you to be a good teacher in your own eyes, not someone else's. We are the only person that can understand our own thoughts and our own ideas of what a good teacher is; listening to ourselves is the only way to draw on those thoughts and ideas. Listen to yourself and BE yourself.

2. The students are very perceptive. At the OAC [university entrance] level you can trust what they say; at younger levels you have to read their actions more than their comments. Each student may need a different kind of teacher; feedback from the students is the best way to realize what kind of teacher that is. Learning to teach is a continuous process. I don't think I can say, "I am this kind of teacher, or that kind of teacher..." The kind of teacher that is best for a class is dictated by the students, by their words or actions (depending on which you trust!)

3. The one thing I have done differently in Round 2 was to take more risks and trust myself more (that gut feeling). But, I also know that I have much to learn, from

students and other teachers. I hope I can always remember that I can learn from other teachers REGARDLESS of their experience. I will always have to do both--learn from myself and others.

[Note: A comment such as this one is reassuring. Calling attention to voices of self and students is not meant to suggest disregarding the voices of others.]

4. I would have taken longer to learn to trust myself. I may have forgotten that my opinion is the most important to ME.

93-YY: 1. "Listen to yourself" made me feel more comfortable with myself and teaching. A boost of confidence; it made me feel more unique and I like that. I believe I have made the "right" choice of being a teacher.

2. "Listen to your students"--direct feedback. I am told what worked and didn't; however I am still kind of uncertain about how to go about "filtering" through what the students told me. Some students can be quite flattering; some are very inconsistent in their comments. Of course, there is also some very obvious general consensus about what students said. In this case, it is easier for me to analyze. But then again, the diversity in student feedback (many times contradicting) shows that a teacher can always satisfy at least one student, so there is at least one happy story to tell. I feel that now I am more comfortable with the idea that "I cannot make every student happy" no matter what I do. My goal now is to make as many students happy as I can.

3. I was less nervous and more comfortable with in-class situations in Round 2 than in Round 1, which is a step in the positive direction and I am glad of it.

93-XX: My associate gave me the freedom to teach the unit any way I wanted, which gave me a lot of range as far as content, material, pace, order, examples, etc. He encouraged me to draw upon my experiences in engineering and mining, to expose the students to some of the applications of math that they might otherwise never get to see. He didn't give a lot of suggestions, but rather, let me take over. (His main comments were boardwork [titles, dates] of the first class, first day; length of lesson; and more time to taking up homework--mostly stuff to keep some of the routine constant).

I was able to "listen to myself" a lot this round, applying some of the stuff I learned last time and at McArthur: improved questioning, better organized, wandered around the classroom a lot (not always teaching from the front), included lots of applications (how's and why's), anticipated difficulties, and abbreviated lessons when they were unnecessary. I tried to vary my approach and used computers a few times to get the students used to them (they will use these graphing programs next year). It was an easy, effective, and time-saving demonstration (in colour, too!): it saved me from drawing graphs on the board and I could reuse the same file for each class.

With small classes it was easy to listen to the students. I tried to key into when they found material very straightforward (perhaps had covered it before) and skimmed over it, or occasionally, had them describe how they might approach a topic, before I had taught it, just going on the topic name alone. I had participation from a wide range of students, including some who do not usually participate at all. I asked the grade 11's for written feedback: their comments included that the lessons could be shorter (some recognized that they had it easy in Steve's classes), others commented on my speaking volume, the amount of time to take up homework, and going over stuff they already knew ("when we've got it, we've got it!"). Mostly the comments were just that they had enjoyed it, and had no suggestions.

With the grade nine class I got to do a lot of work one-on-one and learned just what the grade nine level (or rather, the RANGE of ability) really is. Answering questions, going over the background material, trying to assert that fractions really are useful in everyday life (and that calculators have NOT made arithmetic obsolete).

I was able to cover another teacher's class one day (grade 11 math), and got a sampling of supply teaching. A confidence booster because it went really well: on short notice I was told I could teach whatever I wanted, so I assembled some of the best of what I had taught my own classes. I was a bit forewarned that the last class period of the day is sometimes difficult, but it went well and the students were receptive and supportive. (They asked to be dismissed early, but then realized - themselves- that since I was a student teacher I probably wasn't allowed to do that).

I noticed a big difference between round 1 and round 2. Nothing concrete or tangible, though, more just perception of teaching. So far, if I had to briefly describe learning to teach, it would be that peer teaching (the beginning) seemed like pretend teaching (abbreviated lessons, artificial situation, and imitation students). A start, but limited in scope. The first teaching round was like acting out a role which was not yet mine. I was in a real setting with a real "audience," but imitating someone else's style and following a "script." It was closer to "really teaching" but not quite there yet. Round 2 finally brought everything together. I was totally comfortable, the tone of the class was friendly and open, I made mistakes and I or the students corrected them, I thought "on my feet," I could try out new ideas, see how they worked, add physics, engineering, and industrial applications. Often I was alone with the class of grade 11's. I really enjoyed the grade 9 and 11 levels (although I also did some one-on-one tutoring of grade 12) and I'm thinking that is the level I'd like to teach. So far it's gotten continually better and better.....can't wait to see what the next round will be like.

93-UU: 1. Yes, often after every lesson, I would think to myself, "Was that a good lesson? How would I change the lesson or parts of it to make it better? Are my thoughts of the lesson the same as my associate's?" Sometimes, as I became aware of my weaknesses in teaching, I would try hard to work on those things next time. For example, in the first few days teaching, both my associate and I noticed that I hadn't given students enough time to answer questions. So I improved a lot in this area near the end of the round by making the conscious effort.

2. Yes. In both teaching rounds thus far, I asked all students to fill out an evaluation of me. After Round #1, the students gave me the following suggestions: try to improve on keeping the class' attention, classroom management skills, meeting students' individual needs, teaching at the appropriate grade level and giving less homework. Although these are still my areas of weakness, I have improved considerably according to the present student evaluations of me this round. Therefore, student feedback is not only beneficial but essential to our "growth" as teachers.

3. Round #2 was the first time I had ever taught a course at the secondary school level. Before Round #2 I had some expectations of what it would be like (i.e., from past high school teachers and from others' experiences at the Faculty of Ed.). However, my teaching experience was unique to everyone else's (just like everyone's teaching experience is unique in itself). I guess that's why it's so difficult to learn how to teach without your own unique experience. Others (including the Faculty of Ed) may give you suggestions and strategies of teaching, but they may or may not work with that particular class. Above all, I think it is essential to know your class first (each student individually) before implementing a teaching strategy. Perhaps a harmonious balance between learning from others and learning from yourself would make the greatest difference in the classroom.

4. If I had not been urged to consider these angles on learning from experience, then I wouldn't have been able to "mature" as a teacher. Without the internal reflections on my teaching and comments from students, I would never have been able to detect the flaws in my teaching. Years could've gone by with me teaching, thinking that I'm doing everything perfectly fine, when really there is much to be learned and improved upon. Without constant internal constructive criticism of ourselves as we teach, we are nothing but aimless, "unconscious" non-teachers, just there to do a job. Teaching is more than just a job; whether we realize it/like it or not, we are "shapers" of the future society.

93-00: Here I now sit, two days into the homeward stretch of my year in Teacher's College. More importantly I have now completed my second teaching round. This is a very exciting time, for a very different reason than I ever would have believed back in September.

When I first accepted the position in the B.Ed. program back last April it seemed like the ideal award to myself after enduring a very painful 3 years at (Company X). The program was an excellent chance for me to relive my glory years as a university student and it gave me the excuse I needed to leave the world of coated abrasives. Reading through the program calendar was very exciting...20 or so hours of classes per week, pass or fail grading, a course called "Outdoor Education" (more importantly it was not called "Thermodynamics") and the promise of interesting and outgoing classmates. The only thing that I did not like the thought of was the 9 weeks or practice teaching I was going to have to complete during my leave of absence from the real world. Despite my fear of this I accepted the offer with no real thought of what it was I was getting myself into. As September rolled around I found myself at McArthur and I was soon introduced to a whole new perspective on life and what I could get out

of it. Through two key instructors I was pointed out the importance of evaluating and examining my own personal experiences as I ventured through my year as a teacher in training. At this point I started to put an effort into keeping a journal to document the important events. The journal was not meant to be a medium to keep straight the chronological order of the year's events but rather a self-reflective medium to try and make sense of the experiences and people that were molding my own personal style of teaching. If I could simplify what this profess of reflection meant to me, it would be to say that there is not any single event that happens in one's life that cannot be learned from. The work is in taking the time to sit down and understand what the significance of the event is. With this in mind I came to the conclusion that, as you progress through life, there becomes no such thing as bad times, only hard times. It is up to the individual to take all opportunities to learn what they can. This way of looking at life was summed up by the phrase, "Experience is what you have when you don't get what you want."

Learning through experience and personal reflection was something that was very new to me as it is not the style advocated in very many undergraduate degrees. The single greatest merit that experiential learning provided me was the ownership to the responsibility of my own education. Perhaps this is something that I am more able to handle after completing the maturing process of an undergraduate degree. Experiential learning allowed me to identify the styles and approaches that I felt would be suitable for my personality. I was not hindered with the nuisance of trying to adapt my style of teaching to a personality that I was not comfortable with. It also allowed me to identify areas and skills required to be a good teacher that were particular problems for me. What would the sense be of a hockey goaltender spending time during practice taking face-offs? Perhaps the greatest thing about experiential education is the importance and vitality I have come to realize it plays in education at any level. It is the realization to me of how much this type of learning is missing from the education system today that has contributed the most to my attitude change from last September. Yes, I am very excited right now, not because my dreaded practice teaching is two thirds over (as I thought would have created great excitement back in Sept.) but rather because my next teaching round is only 4 weeks away. Oh ya, the 20 or so hours of classes and the pass or fail grading is exciting too!

Looking back through my journal I found the following excerpt I made in September.

> You are a product of your experiences. You are a sum total of what you have done with life. It only stands to reason that it makes you a much better person if you take some time to sit down and understand those experiences. You are not a product of your public knowledge. There will always be someone somewhere with more public knowledge in any particular subject. However there is only one person who has lived what you have lived. This makes it very important to realize that you must learn from all the situations you find yourself in. You must think about how the different situations affect you. What you like and dislike about them. How important and essential is learning from a textbook?

93-QQ: *Listening to myself is VITAL!* It is still fresh in my mind, my learning experience, my struggle with Engineering and the realization about what and how I learned have been flowing out as I get experience in classrooms and discuss issues with students here! During this last round, my own self-reflection was very important because I did not get as much or as specific feedback after each lesson as I did from my first associate.This was a positive experience though, for me to ask questions of myself and to my associate.

Feedback from the students is also very important. They are human beings and have reactions to what happens to them. We are not feeding machines to spew out what we want! We, as science teachers, teach observation skills in laboratories but FAIL to take clues form observations of students who are bored, lazy, sleepy, confused... Often you have to ask the students if they liked something. Only certain students will volunteer information like "that activity really helped me visualize the concept."

One of the things that I have learned is that students are conditioned to traditional methods and it takes a few activities for them to get used to another method of teaching. As teachers, it is so easy to get sucked into the routine. It takes a lot of energy to teach experientially or to all learner types and you need some sort of administrative support from teachers, department heads, etc.

If you don't listen to yourself and the students, you will be fast-tracked into the system as it exists, which tends to be very conventional, institutional and geared to one type of student.

Reflecting back, I was that type of student. I did what I had to to get the marks. "Excellent" in their sense and went to university and did the same thing. Now I sit here and wonder what I learned! Did anything stick? Why am I just grasping the basic fundamental concepts of physics now?

CONCLUSION

Only time will tell whether others see in these data a range of meanings similar to the ones I see as the teacher of the course. This is the fifteenth year that I have taught this type of course, and I have never seen so many students telling me in so many ways that they are listening to themselves and to their students, as well as to their professors and the experienced teachers in whose classrooms they practice. I believe these data confirm that student teachers can be taught to recognize the authority of experience and to include its messages in their development as teachers. I was pleased that WW, YY, and XX referred directly to their sense of "confidence." This particular perspective may have been suggested by R's extensive references to confidence; some students have pointed out that they disagree with his position that confidence is the only gain from their preservice program.

I find it impossible to separate my progress in teaching student teachers to recognize the "authority of experience" from my own experiences "returning to the classroom." In hindsight, it is particularly telling that the "payoff" came in a completely unanticipated form. I thought there would be value in taking the student teachers into my own classroom where

they could question me about what my reasons were for the practices they observed. In 1992-93 I held one class each week in the physics classroom in the school, where I had just finished teaching. The impact was disappointing at best. The student teachers seemed unable to relate to what I was doing. I now would argue that they did not have enough of their own teaching experiences to take advantage of the opportunity my teaching presented. If they had had extensive teaching experience in the fall term and I had taught in the school in the winter term, then the results might be different and more as I had hoped. Those students in the physics method course were unable to "have my experiences"; they had to have their own experiences first.

The challenge to begin to interpret what was (not) happening to the student teachers in 1992-93 led us to the notion of recognizing "the authority of experience" as a potentially relevant goal for student teachers. As the data presented here suggest, a significant portion of this year's students have found meaning in the concept of authority of experience, now that they have had two three-week teaching placements. When I made the decision not to teach in the secondary school this year, I hoped that the time I might have invested in that activity would be put to good use for the teacher education students. This goal seems to have been achieved, although I know the territory of teacher education well enough to recognize that every year is different and that there is much more work to be done exploring the "authority of experience" as an element of a teacher education program. The swamps and the high hard ground are never quite where we expect them.

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